If you are using a printed copy of this procedure, and not the on-screen version, then you MUST make sure the dates at the bottom of the printed copy and the on-screen version match. The on-screen version of the Collider-Accelerator Department Procedure is the Official Version. Hard copies of all signed, official, C-A Operating Procedures are available by contacting the ESSHQ Procedures Coordinator, Bldg. 911A

C-A OPERATIONS PROCEDURES MANUAL

15.3.3.24 Removal and Replacement of Siemens Motor and Generator Rotors

(Booster/AGS Ring Power Supply Systems Group Procedure EPS-S-024)

Note: This document was formerly a C-A Group Procedure. The content of the group procedure was reviewed by the Technical Supervisor. All approvals and/or issue dates of the original group procedure are maintained for present use.

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approved: _____***Signature on File***_____ _____
Collider-Accelerator Department Chairman Date

M. Bannon

Booster/AGS Ring Power Supply Systems
Group Procedure EPS-S-024
Revision 00

1.0 PREPARATION (ELECTRICAL)

1.1 Open CB-52G from Rack 5074 in the new Control Room by pressing the **STANDBY** pushbutton. [ ]

1.2 Switch motor from cycloconverter to the liquid rheostat (CB-19R opens and CB-19S closes) [ ]

1.3 Open CB-52 and let the motor coast down, record the coast down time [ ]
_____MIN.

1.4 Follow: OPM 2.6.6.a to Lockout AGS MMPS and allow ring access [ ]

1.5 If the shutdown is during cold weather and there is a chance of water freezing then heaters will have to be put into the inductor houses. Two heaters in each house.
Inductor House STA I [ ] Inductor House STA II [ ]

1.6 If the shutdown Notify line crew that we want the 13.8KV CB-911-15 in Bldg.603 which feeds Siemens MG set, opened & racked out of its cubicle. The Siemens Supervisor or his designee shall install his lock and tag on this CB-911-15 so that it is under his control. (**Note: If possible have the linecrew rack in the shorting breaker which tie the cables which feed the Siemens MG Set to ground)** [ ]

1.7 Take the key from lock which was installed on the CB-911-15 and put in the lock box next to the 242 Magnet Area. Then the Siemens Supervisor or his designee shall install a lock and tag on the lock box and be the responsible person. All others who need to LOTO the MG set will install their locks on this lock box. [ ]

1.8 Once CB-911-15 in Bldg. 603 has been LOTO verify at 3 locations (1 on LE1 in old control room, 2nd in the new control room Rack 5090 and 3rd in L13 Rack in Bldg. 928 Basement that the 13.8KV read zero volts. When it has been verified at the 3 locations, then open cubicle L13 in the Siemens Basement and verify using a Tic Tracer that the 13.8 KV feed is indeed off. **(Note: CAT 4–PPE must be worn when performing this test.)** After it has been verified that the 13.8KV is deenergized, install a set of ground cables in rack L13 from each phase to ground. Install a sign in Bldg. 603 on CB-911-15 stating there are grounds installed in Bldg. 928 Cubicle L13. Now CB-52M can be rack out wearing CAT-4 PPE and the Kirk Lock Key RE11012 can be inserted in motor pit door for access [ ]

1.9 Have the linecrew rack out the 480 VAC 3 phase feed to the exciter P.S which is CB-43 (CB-52E) which is located in the old RF Subyard. [ ]

The Siemens Supervisor or his designee shall LOTO this CB and be the responsible person.

2.0 LOTO all the 125 VDC (CAT 2 –PPE) CB located inside the 120 VDC [ ] distribution panel located on the North Wall of the old Control Room.

CB-1 [ ], CB-2 [ ], CB-3 [ ], CB-4 [ ], CB-5 [ ], CB-6 [ ], CB-7 [ ], CB-8 [ ], CB-9 [ ], CB-10 [ ]

2.1 LOTO the following 480 VAC FDS in Siemens Basement (PPE- CAT 4)

EPP-44-2	FDS # 5	OIL LIFT PUMPS	[ ]
(NOTE)	FDS #6	OIL LIFT PUMPS	[ ]
	FDS # 9	BRAKE P.S.	[ ]
PP-44-1-B-	FDS #8	LB-1 STA I F BANK	[ ]
	FDS #9	LB-1 STA I P BANK	[ ]
	FDS #1	LE3	[ ]
PP-44-1-A-	FDS # 3	LC-1 STA II P BANK	[ ]
	FDS # 4	LC-1 STA II F BANK	[ ]
	FDS # 1	LA1L	[ ]
	FDS # 2	LA2L	[ ]

Note:
It will be necessary when taking out the coupling bolts to turn the lift pumps on so the rotor can spin until all coupling bolts have been loosened. After bolts are loosened then the lift pump FDS Switches can be secured.

2.0 PREPARATION (MECHANICIAL)

2.1 MG Room completely cleaned out
2.2 Remove old control door S into the MG Room
2.3 Set up tools in the old Control Room
2.4 Micarta Sheets
2.5 Teflon Sheets
2.6 Hydraulic Jacks
2.7 Metal saddles for hydraulic jacks
2.8 Wood cradles for bearings
2.9 Generator tail shaft
2.10 Counter weights
2.11 Spool pieces
2.12 Wood wedges and wood
2.13 Steel caster for pedestal #2
2.14 Bolt lockers
2.15 Impact guns
2.16 Floor shoring in basement with hydraulic jacks under (set for 2000psi)
2.17 Hydraulic oil pump
2.18 Hydraulic (Norwolf) coupling bolt wrench

Note:

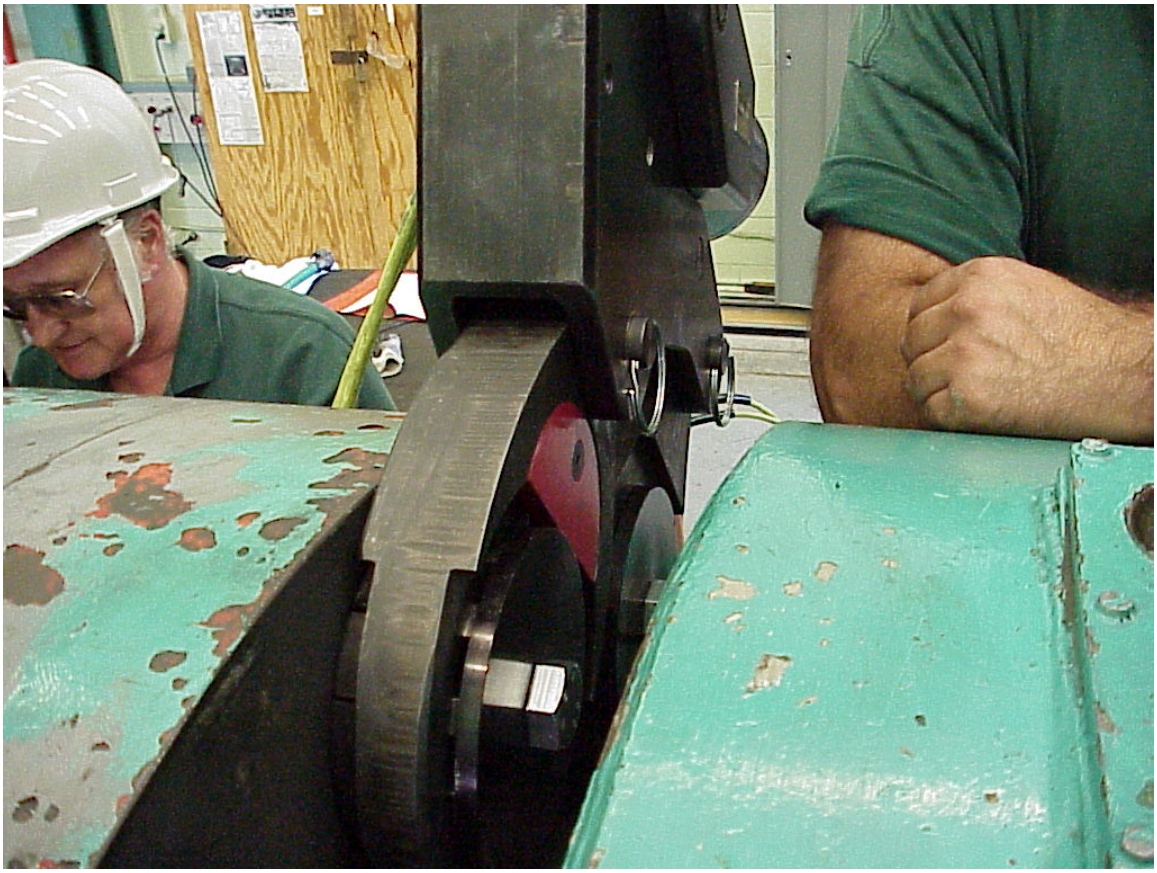
If we are going to do the rigging with our equipment then the dollys will have to be cleaned and greased. They are presently in the shed outside Bldg. 928.

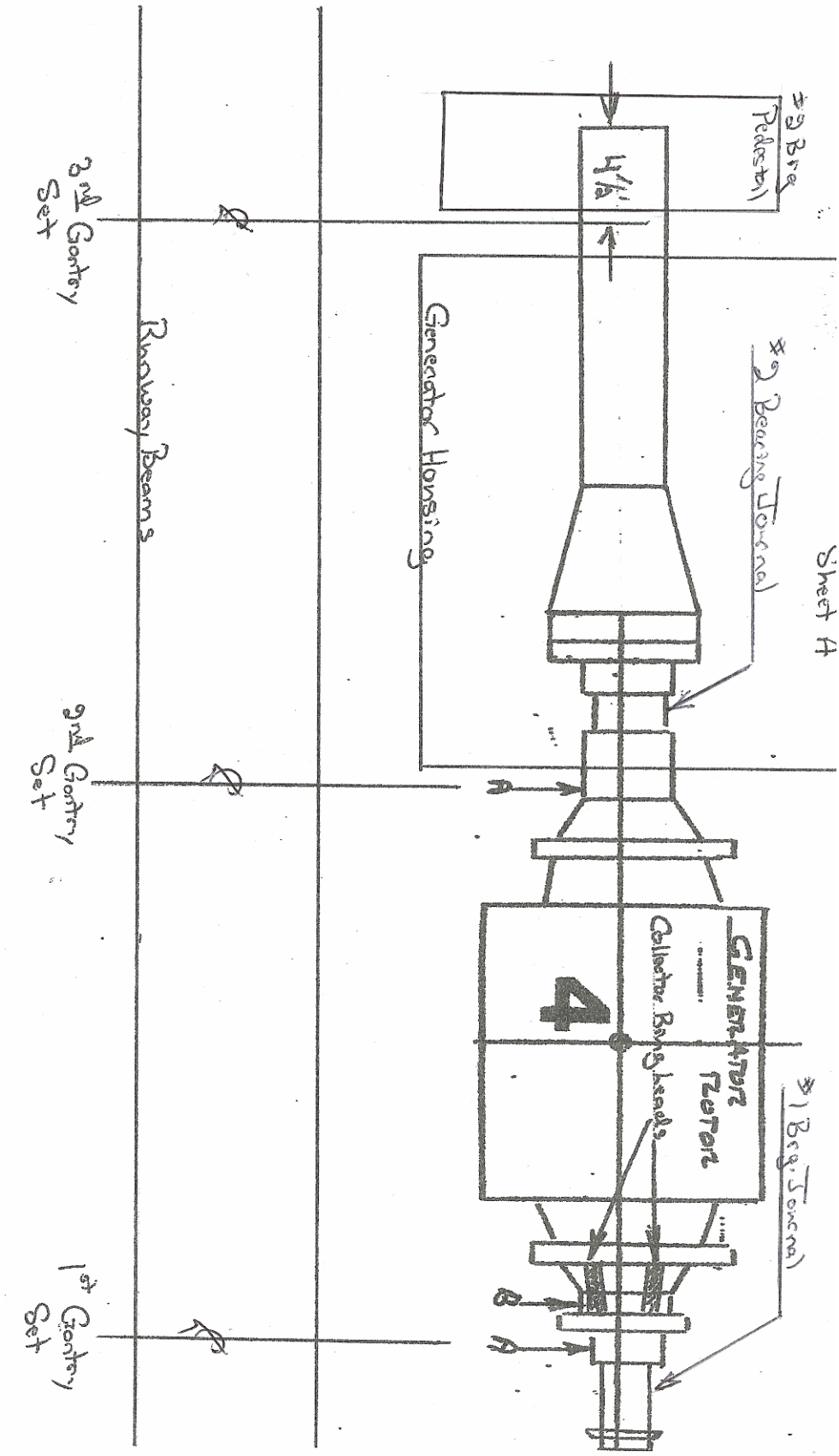
3.0 SAFETY

2.1 Hard hats, safety shoes, work gloves, safety glasses
2.2 All BNL employees involved shall be qualified for crane operation.
2.3 Critical lift permit must be drawn up and submitted to BNL before any actual lift of the rotors are permitted.
2.4 If an outside rigging crew is hired then they have to go to contractor orientation training.
2.5 Riggers must submit a formal rigging plan.
2.6 Any rigging equipment use by outside rigging has to inspected by BNL (Contact our rigging Foreman)
2.7 All temp floor plates must be installed before rotor removal at both the motor and the generator.
2.8 Slings that are used to pick up the rotors are ours (orange ones hanging on the west wall of the mg room. We have certificates on these slings stating there lift capability and the over stressed test data.
2.9 No unauthorized personnel are allowed in the MG Area while the mg set is being disassembled or assembled**.**

4.0 DISASSEMBLE OF THE MG SET

4.1 Remove the motor intake fan motor assembly.
4.2 Remove the motors exhaust air elephant trunk.
4.3 Remove the motor brush rigging cover. (Dog house)
4.4 Remove the air baffles on the brush rigging.
4.5 Remove the outer metal covers on the north and south side of the motor.
4.6 Remove the fiberglass covers on the north and south side of the motor.
4.7 Put down the floor covers on the north and south end of the motor so no one can fall into the motor pit from the mg room.
4.8 Unbolt all the buswork form the motor brush rigging and then remove both halves of the motors brush rigging and put into storage crate.
4.9 Lower all the buswork into the motor pit.
4.10 Remove the stand with IRD speed transducer on it which is in front of the dampener.
4.11 Remove the cover to the dampener.
4.12 Unbolt the dampener using the saddle design for this purpose and put the dampener into its storage cradle for now.




#2 Brg. Pedestal
4½'
3rd Gantry Set
Generator Housing
#2 Bearing Journal
Sheet A
Runway Beams
2nd Gantry Set
GENERATOR ROTOR
4
Collector Brush Leads
#1 Brg. Journal
1st Gantry Set


RIPP BOWMAN PHOTO 9-24-02
FILE # 22-9-24-02


RIPP BOWMAN PHOTO 9-24-02
FILE # 04-9-24-02


BUDCO
MASTER RIGGERS
RIPP BOWMAN PHOTO 9-24-02
FILE # 07-9-24-02


BUDCO
RIPP BOWMAN PHOTO 9-24-02
FILE # 16-9-24-02


KNAACK
RIPP BOWMAN PHOTO 9-24-02
FILE # 08-9-24-02


RIPP BOWMAN PHOTO 9-24-02
FILE # 17-9-24-02


RIPP BOWMAN PHOTO 9-24-02
FILE # 06-9-24-02


NO SMOKING
RIPP BOWMAN PHOTO 9-24-02
FILE # 03-9-24-02